

## REMARKS

With the entry of the amendments above, claims 1, 9 and 11-17 will be pending in this application. Applicants have canceled non-elected claims 2-8 without prejudice, have replaced the abstract with the new abstract attached as an Appendix to this paper to overcome the objection to the specification and have amended the claims to overcome the rejection of claims 1 and 9-13 as indefinite under 35 USC 112, second paragraph. Applicants respectfully request that the objection to the specification and the rejection of the claims under 35 USC 112, second paragraph, be withdrawn.

Claims 1, 9, 10, 12 and 13 stand rejected as anticipated by the Hasegawa Japanese reference. The Examiner reads Hasegawa JP as teaching "joining steel pipe pieces with transient liquid phase alloy, containing the claimed amounts of V and other elements, wherein the alloy is amorphous nickel based." The Examiner relies upon the Abstract, Figures 1 and 2, paragraphs 6-9, 13, 17-19 and Table 1 of Hasegawa. The Examiner concedes, "While the pipe may not have actually been precision machined, it would be indistinguishable from a pipe that had been precision machined." This rejection and its supporting reasoning are respectfully traversed.

As explained in the specification of this application and pointed out in the claims, this invention is directed to the provision of precision machine parts that are made up of a plurality of pieces. The Examiner already recognizes that there is a substantial difference between the pipe disclosed in Hasegawa JP and the claimed precision machined parts, so that persons of ordinary skill in the art would not have been put in possession of this claimed invention by the disclosure

in Hasegawa. This distinction alone is enough to show that the claims are not anticipated by Hasegawa JP.

Furthermore, persons of ordinary skill in the art would not have thought to apply the disclosure of Hasegawa to provide the specific invention claimed, because the bonding of pieces in the Hasegawa JP reference is not along faces extending a longitudinal axis of the precision machine part. Instead, the bonding shown in Figures 1 and 2 of Hasegawa JP is along a face that is perpendicular to the longitudinal axis of the part. This is not a mere semantic distinction, but is very significant in providing the precision machine part to which this invention is directed. As the Examiner will note from the figures in this application and the detailed disclosure, it is possible to create precision machine part containing multiple and complex conveyance passages within them without having to machine those passages through solid material. Instead, portions of the machine part containing complementary passages may be cast or forged and then those pieces may be bonded side-by-side to form a single precision machine part having one or more complex conveyance passages through it. Hasegawa does not teach nor suggest this significant aspect of the invention and therefore neither anticipates nor renders obvious the invention as claimed.

Applicants find it interesting that the Examiner, who does not claim to be able to read Japanese, has referred to specific paragraphs of the Hasegawa JP reference. Perhaps the Examiner is relying upon the translation of this reference which he does not see fit to share with applicants and to place on the record. Applicants call upon him to do so if he has, in fact, relied upon a translation. In any event, applicants note that the bonding alloys disclosed in paragraph

[0008] of Hasegawa are actually alloys in the prior art to Hasegawa which contain 15-30% silicon and relatively little iron. The alloys of paragraphs [0006] – [0009] are not the claimed amorphous bonding alloys of the broad claims in this application. By the same token, paragraph [0013] discloses silicon-containing alloys, which are not claimed in all of the rejected claims. Finally, paragraph [0017] explains that silicon contents of 1 to 8 % make the alloy amorphous, whereas the alloy set forth in claim 11 contains no silicon. This argument, does not, of course, apply to the broadest claims in this application, but is applicable specifically to claim 11.

Claims 1, 9-11 and 13 stand rejected under 35 USC 103(a) on the Hasegawa US reference. This rejection and its supporting reasoning are respectfully traversed.

Applicants note first off that the Examiner is not applying the Hasegawa US reference to claim 12, which requires the alloy to be an amorphous Ni-base alloy. Applicants agree with the Examiner's recognition that Hasegawa US does not teach the subject matter of claim 12. As is the case with Hasegawa JP, Hasegawa US does not teach or suggest the bonding of the pieces of the precision machine part along faces extending along the longitudinal axis of the precision machine part, so it would not have been obvious to arrive at the invention of this application from Hasegawa US. Persons of ordinary skill in the art would have had no motivation to join the pieces in a direction other than that disclosed. For this reason alone, the invention as claimed is patentably distinguishable from Hasegawa US.

The Examiner seems to take the position on page 7 of the Action that "the claimed article would encompass those of Hasegawa [US]." For the reason just mentioned, the claimed article is quite different from the article disclosed in Hasegawa US, since the manner of joining of the

pieces of the article is specifically set forth in the claims and would not have been suggested to persons of ordinary skill in the art by Hasegawa US.

The last sentence of the statement of rejection on page 7 of the Action appears to be directed at claim 11, which is now being divided into claims 11 and 17. The Examiner states, “Moreover, where the materials and processes of Hasegawa [US] to obtain greater than claimed deformation under the conditions of Hasegawa [US], the final articles would not appear to be necessarily precluded from being obtained under different heat treatment conditions that meet the claimed deformation requirement.” With all due respect to the Examiner, that statement is virtually incomprehensible to applicants and their attorney and appears, if interpreted broadly, to transform the Examiner’s initial burden of presenting a *prima facie* case of obviousness into a burden on applicants’ part to forestall such a rejection even in the absence of substantial evidence to support it. The Examiner is using the disclosure of Hasegawa US as evidence that it would have been obvious to arrive at articles that meet the claimed deformation requirement, which the Examiner admittedly does not find disclosed in Hasegawa US. Based on this lack of disclosure, however, the Examiner seems to be saying that if one *were* to use different heat conditions than those described in Hasegawa US, one *might* arrive at the claimed deformation conditions. If that were so, applicants respectfully point out, achieving the claimed deformation conditions would not have been the result of anything disclosed in Hasegawa, meaning that under the Examiner’s own logic, Hasegawa would not have put persons of ordinary skill in the art in possession of the claimed deformation requirements of current claim 17. Certainly, there is no motivation apparent


from Hasegawa US to use any such different heat treatment conditions, even if the Examiner's approach is otherwise correct.

For the foregoing reasons, early action allowing claims 1, 9 and 11-17 is solicited.

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### **ABSTRACT OF THE DISCLOSURE**

A precision machine part is made of a plurality of pieces with a transient liquid phase diffusion bonding alloy provided between the pieces to bond them together. The precision machine part has one or more conveyance passages formed in it, has a longitudinal axis and is configured to permit passage of liquid or gas through the conveyance passage from a pipe line or cylinder. The pieces of the precision machine part are adhered to each other by transient liquid phase bonding with a ribbon of an amorphous bonding alloy. The bonding alloy can contain 1 to 10 atomic % V or can contain 1 to 15 atomic % of B or P or a mixture of B and P and 1 to 10 atomic % V, the balance being Fe and unavoidable impurities, and can exhibit an amount of contraction in a bonding stress loading direction caused by plastic deformation in the bonding process of not more than 5%. The bonding alloy may be an amorphous Ni-base alloy.